



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF
AIR AND WASTE

MAR -2 2017

Ms. Tiffany Floyd
Administrator
Air Quality Division
Idaho Department of Environmental Quality
1410 North Hilton
Boise, Idaho 83706

Dear Ms. Floyd:

This letter is in response to the Idaho Department of Environmental Quality's (IDEQ's) submittal dated September 30, 2016, regarding elevated 24-hour PM_{2.5} concentrations measured at the Pinehurst monitoring station (AQS site # 16-079-0017) on September 15 and 16, 2013, and an elevated PM₁₀ concentration monitored on September 15, 2013. The PM₁₀ concentration measured on September 15, 2013, exceeded the 150 µg/m³ PM₁₀ 24-hour National Ambient Air Quality Standard. IDEQ has requested that the Environmental Protection Agency concur that the 24-hour PM_{2.5} concentrations for September 15 and 16, 2013, and the 24-hour PM₁₀ concentration on September 15, 2013, were caused by exceptional events due to dust entrained by high winds and transported to the Pinehurst monitor.

Our response to IDEQ's request is governed by the "Treatment of Data Influenced by Exceptional Events" rule (81 FR 68216, October 3, 2016). After careful consideration of the information provided, we concur with IDEQ's exceptional events flag for the September 15, 2013, PM₁₀ value at the Pinehurst monitoring station. The basis for our decision on this concurrence is set forth in the enclosed document. The 24-hour PM_{2.5} concentrations measured at the Pinehurst monitoring station on September 15 and 16, 2013, do not currently have regulatory significance and were not reviewed at this time. This does not preclude the EPA from reviewing this data at a future time if these dates and values develop regulatory significance.

Note that the EPA's decisions on exceptional event exclusions are not considered final agency action until they are acted upon as part of a final regulatory action subject to public notice and comment. Such actions would include, for example, decisions to exclude the affected data from use in an action to designate or re-designate an area, a determination of attainment, or another regulatory decision identified in 40 CFR 50.14(a)(i).

Thank you for IDEQ's timely submittal of this exceptional event documentation. If you have any questions or wish to discuss this matter further, please contact me or have your staff contact Justin Spenillo, Air Planning Unit, Office of Air and Waste, at (206) 553-6125.

Sincerely,

A handwritten signature in black ink, appearing to read "Tim Hamlin". The signature is fluid and cursive, with a long horizontal stroke at the end.

Tim Hamlin
Director

Enclosure

cc: Ms. Mary Anderson
IDEQ

Mr. Bruce Louks
IDEQ

EPA, Region 10

Review of Exceptional Event Request

Pinehurst, Idaho

24-hour PM₁₀ NAAQS

Date Analyzed: September 15, 2013

Background

On October 3, 2016, the EPA published a final rule, *Treatment of Data Influenced by Exceptional Events* with an effective date of September 30, 2016 (Exceptional Events Rule or EER at 81 FR 68216). The 2016 Exceptional Events Rule governs the review and handling of certain air quality monitoring data for which the normal planning and regulatory processes are not appropriate and revises the rule initially adopted by the EPA on March 22, 2007 (72 FR 13560). Under the Exceptional Events Rule, the EPA may exclude data from use in determinations of National Ambient Air Quality Standard (NAAQS) exceedances and violations if a state demonstrates that an “exceptional event” caused the exceedances. Before the EPA can exclude data from these regulatory determinations, the state must notify the Administrator of its intent to exclude data by flagging the data in the EPA’s Air Quality System (AQS) database and engaging in the initial notification process. Then, after notice and opportunity for public comment at the state level, the state must submit a demonstration to justify the exclusion. After considering the weight of evidence provided in the demonstration, the EPA decides whether or not to concur with each flag. Final action on the data exclusion does not occur until it is acted upon as part of a final regulatory action subject to public notice and comment.

Idaho Department of Environmental Quality (IDEQ) Request

The IDEQ requested concurrence on flagged 24-hour PM_{2.5} data on September 15 and 16, 2013, and 24-hour PM₁₀ data on September 15, 2013, at the Pinehurst monitoring station (AQS site # 16-079-0017); herein referred to as the Pinehurst monitor. The recorded 24-hour PM_{2.5} and PM₁₀ levels for which the IDEQ is requesting the EPA’s concurrence are shown in Table 1. PM₁₀ levels from the submitted day exceeded the 150 µg/m³ PM₁₀ NAAQS.

Table 1. IDEQ Flagged 24-hr PM_{2.5} and PM₁₀ Values at the Pinehurst Monitor Due to a High Wind Dust Exceptional Event

Date	PM _{2.5} Concentrations (µg/m ³)	PM ₁₀ Concentration (µg/m ³)
September 15, 2013	25.4	157.1
September 16, 2013	20.3	Not Requested

The IDEQ flagged the monitored values as due to a high wind dust exceptional event. The agency made the documentation available for public comment for 30 days starting on July 29, 2016. The IDEQ submitted the exceptional event demonstration package, including public comments and state response,

to the EPA on September 30, 2016.¹ The IDEQ requests concurrence from the EPA for the flagged days, based on IDEQ's conclusion that the data has regulatory significance with regard to the PM_{2.5} annual design value and the PM₁₀ 24-hour design value of the Pinehurst monitor.

The EPA's Exceptional Event Evaluation

The EPA has determined that the PM_{2.5} values on September 15 and 16, 2013, do not currently have regulatory significance, but that the PM₁₀ exceedance on September 15, 2013, has regulatory significance for use in IDEQ's PM₁₀ limited maintenance plan demonstration currently in development. Therefore, the EPA has evaluated whether the documentation provided by the IDEQ for the PM₁₀ value on September 15, 2013, meets the requirements of an exceptional event under the Exceptional Event Rule.

The matrix below summarizes the requirements of the Exceptional Events Rule and describes how the IDEQ met each requirement. All references to page numbers, tables, and figures relate to the IDEQ's September 30, 2016 submittal.

Procedural Requirements:	The EPA's Evaluation of Flagged Exceedances:
<ul style="list-style-type: none"> The state must notify EPA of its intent to request exclusion of data as due to an exceptional event by creating an initial event description and flagging the associated data in the EPA's AQS database, and engaging in the Initial Notification of Potential Exceptional Event Process. 40 CFR 50.14(c)(2)(i). 	<p>IDEQ flagged and described the September 15, 2013, 24-hour PM₁₀ value as due to a high wind dust exceptional event in the EPA's AQS database prior to July 1, 2014.</p> <p>IDEQ has also participated in the EPA, R10 Annual Exceptional Events teleconference on March 10, 2016, and subsequent meetings to discuss data potentially influenced by an exceptional event, to determine if the identified data may affect a regulatory determination, and to discuss development of an exceptional event demonstration.</p>
<ul style="list-style-type: none"> The public had an opportunity to review and comment on the demonstration justifying data exclusion; any public comments received by IDEQ were included in the demonstration; and the demonstration addresses those comments disputing or contradicting factual evidence provided in the 	<p>IDEQ provided a 30-day public comment period on the documentation for the claimed exceptional event. The public comment period ran from July 29, 2016 to August 29, 2016. The comments received and responses to these comments were combined in the document titled "2013 Pinehurst Exceptional Events Comment Package" that was included as part of the exceptional event demonstration submittal.</p>

¹ Although this submission was on the effective date of the 2016 Exceptional Event Rule, IDEQ developed its documentation based on the 2007 rule.

demonstration. 40 CFR 50.14(c)(3)(v).	
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Technical Criteria:	
<ul style="list-style-type: none"> The demonstration includes a narrative conceptual model that describes the event as provided in 40 CFR 50.14(c)(3)(iv)(A). 	<p><i>Conceptual Model</i></p> <p>The IDEQ developed a conceptual model in Section 1 of its demonstration which describes that the high wind dust event and subsequent haboob, a very strong dust storm carried by a weather front, were caused by thunderstorms in north central Oregon (Figure 13) and then traveled northeast through Washington, Idaho, and into Canada (Figure 7 – Gust front arrival times). The high winds originated in north central Oregon around midday (~2 pm) on September 15, 2013, and traveled across the Columbia Plateau (~5 pm) in eastern Washington entraining dust along the way northeast toward Spokane in eastern Washington. The haboob reached Spokane in the evening (~8 pm) where 1-hour average wind speeds of over 34 miles per hour (mph) were recorded. As the haboob entered Idaho, it split into two segments as shown in Figure 3. One segment of the haboob proceeded northeast through Coeur d’Alene, Idaho, and then Pinehurst, Idaho, later in the evening (~9 pm) of September 15, 2013. After entering Idaho, wind speeds began to lose intensity, and as it passed through Pinehurst the maximum 1-hour wind speed had dropped to 10.5 mph.</p> <p>The IDEQ describes how the entrained dust primarily came from agricultural lands in the Horse Heaven Hills and the Columbia Plateau in Washington, and not from lands under the jurisdiction of the State of Idaho, which are generally forested in the areas at issue. Similar conclusions were drawn in an exceptional event demonstration completed by the Washington Department of Ecology for the same haboob, with the Horse Heaven Hills in south central Washington identified as the primary source of entrained dust. The IDEQ demonstration documented wind speeds throughout the multistate trajectory of the haboob (Table 2) and high PM values (Appendix C), which supports the assertion that dust was entrained in the Horse Heaven Hills and upwind across the Columbia Plateau of eastern Washington. The demonstration also documented preexisting moderate drought conditions in Oregon and south-eastern Washington (Figure 5) along with noting that agricultural soils in this area were susceptible to erosion. These findings support that the dust was entrained in these areas. Further evidence that dust was entrained along the Columbia Plateau north of Horse Heaven Hills is that the PM₁₀ concentrations measured in Spokane exceeded the concentrations measured in Kennewick, which is just north of the Horse Heaven Hills. The IDEQ also describes how the haboob likely stopped entraining dust when it crossed into Idaho, as the</p>

	<p>recorded wind speeds began to drop below EPA's default high wind threshold of 25 mph (1-hour average) and the transition from Washington to Idaho is marked by a transition from agricultural land to primarily undisturbed forested land (Figure 6).</p> <p>The information in the IDEQ's submission provides a detailed description of the event, which satisfies the conceptual model criteria. The submission also includes a table of the data requested for exclusion which has been replicated in this analysis document.</p>
<ul style="list-style-type: none"> The event meets the definition of a "high wind dust event" in 40 CFR 50.1(p). 	<p><i>High Wind Dust Event</i></p> <p>As described in IDEQ's discussion of the conceptual model of the event, the event included high wind speeds that entrained dust and transported the dust to the Pinehurst monitor. The EER contains a presumptive high wind threshold for identified Western states. Idaho is not included in that list. The Columbia Plateau in eastern Washington has a high wind threshold of 18 mph. There were nine hourly wind speed averages that exceeded 18 mph and an additional four hourly averages that exceeded 25 mph at meteorological stations in the path of the haboob in Washington. Although one hourly average wind speed above the 18 mph threshold was recorded in Idaho during the event, the information provided indicates that the high winds in Washington entrained the dust which was transported to the Pinehurst monitor in Idaho. The weight of evidence supports the conclusion that the event meets the definition of a high wind dust event under the Exceptional Events Rule.</p>
<ul style="list-style-type: none"> The event satisfies the "clear causal relationship" criteria in 40 CFR 50.1(j); 40 CFR 50.14(c)(3)(iv)(B). 	<p><i>Clear Causal Relationship</i></p> <p>As evidence that the event affected air quality, the IDEQ identified that the data in question exceeded the PM_{2.5} annual standard and PM₁₀ 24-hour standard (Table A). To demonstrate a clear causal relationship between the high wind dust event and the elevated PM concentrations at the Pinehurst monitor, the IDEQ examined the meteorological conditions that caused the event, the geographic extent of the event, and the temporal relationship between wind speeds and elevated PM concentrations at several monitors along the storm path, including the Kennewick, Spokane, Pinehurst monitors.</p> <p>As explained in the conceptual model, multiple thunderstorms in north-central Oregon occurred midday on September 15, 2013 (Figure 13) and caused a haboob. Radar images of the storm front demonstrate it moved northeast from Oregon, through Washington, and into northern Idaho, as shown in Figures 13-18.</p> <p>The IDEQ compared the hourly average wind speeds with the area specific wind dust thresholds at ten stations along the haboob path</p>

	<p>(Table 2). The IDEQ analysis showed that in Washington, the wind speeds at monitor BPKEN in Kennewick, Washington, and KAKSA in Spokane, Washington, exceeded the default 25 mph wind threshold identified in the EPA's EER. The weight of evidence shows that winds in Washington were strong enough to entrain the dust in Washington and carry it into Idaho where the winds continued to carry the dust but not further entrain dust from Idaho given the decreasing wind speed and the crossing of terrain less likely to have dust entrained.</p> <p>The demonstration goes on to show PM₁₀ and PM_{2.5} concentrations at several monitoring stations increasing and decreasing in values in response to fluctuating wind speeds associated with the haboob as it passed each monitoring station through Washington and into Idaho (Figures 23 and 24). In Figure 25, the IDEQ also showed how the high winds associated with the storm affected PM₁₀ and PM_{2.5} concentrations and the PM_{2.5}/PM₁₀ mass ratios measured at the Pinehurst monitor. The PM_{2.5}/PM₁₀ mass ratios are variable before and after the event, but consistently low during the event, which supports the conceptual model that a dust storm with a consistent mix of PM_{2.5}/PM₁₀ from agricultural soil passed through the area later in the evening of September 15, and into the morning of September 16. The Pinehurst area is occasionally impacted by elevated PM_{2.5} due to smoke from wildfires, prescribed burning, and residential wood combustion, but these sources could not have been contributing on the event day as they would have resulted in a much higher PM_{2.5}/PM₁₀ ratio.</p> <p>Based on the suite of evidence provided, including radar images, surface wind speed and wind direction data, maps of meteorological and monitoring stations, and hourly PM monitoring data, the EPA concludes that there is a clear causal connection between the elevated PM₁₀ concentration recorded at the Pinehurst monitor on September 15, and the high wind dust event.</p>
<ul style="list-style-type: none"> • The demonstration includes an analysis comparing the claimed event-influenced concentrations to concentrations at the same monitoring site at other times to support the "clear causal connection" requirement. 40 CFR 50.14(c)(3)(iv)(C). 	<p><i>Event-Related Concentrations Compared to Historical Concentrations</i></p> <p>In section 3 of the demonstration, the IDEQ compared the event influenced concentrations to concentrations from the same monitoring site over the course of multiple years and seasons to support that the event affected air quality and that there was a clear causal relationship between the event and the monitored exceedance.</p> <p>PM₁₀</p> <p>The IDEQ plotted all PM₁₀ concentrations at the Pinehurst monitor from 2009-2013 (Figure 8). Over the five-year period, only two days recorded concentrations over the 24-hr PM₁₀ NAAQS (150</p>

	<p>$\mu\text{g}/\text{m}^3$), both of which are connected to wind events. On the high wind dust event day for PM_{10}, September 15, 2013, the concentration measured at the Pinehurst monitor was $157.1 \mu\text{g}/\text{m}^3$, which is the highest value for the entire period.</p> <p>PM_{2.5} The IDEQ plotted all $\text{PM}_{2.5}$ concentrations at the Pinehurst monitor from 2009-2013, (Figure 10). Over the five-year period, there are a number of exceedances of both the annual and 24-hr $\text{PM}_{2.5}$ standards. In Figure 11, IDEQ plotted the Pinehurst $\text{PM}_{2.5}$ concentrations for only the Septembers of 2009-2013. Statistically, the $\text{PM}_{2.5}$ concentrations on the September 15, 2013 event day ranked in the 87 percentile compared to the historical annual data, in the 98 percentile for the historical September data, and was the maximum value for the September data when other documented wildfire exceptional events were excluded (Table 1). Similarly, the $\text{PM}_{2.5}$ concentrations on the September 16, 2013, event day ranked in the 79 percentile for the annual data, in the 95 percentile for the seasonal data, and in the 98 percentile for seasonal data when other documented wildfire exceptional events were excluded.</p> <p>These results demonstrate that the PM_{10} concentration in Pinehurst on the event day was in excess of normal historical fluctuations, including background, and support the conclusion that there is a clear causal connection between the high winds entraining dust in Washington and elevated PM concentrations at the monitor in Pinehurst, Idaho.</p>
<ul style="list-style-type: none"> • The event satisfies the “not reasonably controllable and not reasonably preventable” criteria in 40 CFR 50.1(j); 40 CFR 50.14(c)(3)(iv)(D). 	<p><i>Not Reasonably Controllable/Not Reasonably Preventable</i> Where an emissions-generating activity occurs outside of the State’s jurisdictional boundaries within which the elevated concentrations were monitored, the State is not required to provide a case-specific justification to support the not reasonably controllable or preventable criterion. 40 CFR 50.14(b)(8)(vii). As shown in the Clear Causal Relationship section, IDEQ demonstrated that the dust entrainment occurred outside of the IDEQ’s jurisdiction, primarily in the Columbia Plateau region of Washington. At the time of the haboob, there were no other sources of PM_{10} or $\text{PM}_{2.5}$ that might have contributed to the high values recorded at the Pinehurst monitor. The IDEQ notes that there were no known sources of industrial emissions that would have contributed to the exceedance. The IDEQ also notes that the mass ratio of $\text{PM}_{2.5}/\text{PM}_{10}$ discussed in Figure 25 indicated that the source of dust associated with the high wind values was primarily agricultural soil, and not from agricultural burning or industrial upsets which would emit a much different $\text{PM}_{2.5}/\text{PM}_{10}$ ratio. Therefore, the not reasonably controllable and not reasonably preventable criteria are met.</p>

	<p><i>Controls in Place in Washington</i></p> <p>Although not necessary for this analysis and concurrence, a summary of soil erosion controls in place in eastern Washington at the time this haboob was provided in a report by the Washington Department of Ecology titled, “Fall 2013 PM₁₀ Exceedances due to High Winds at Kennewick, Washington” and is included informationally. As excerpted from EPA’s May 23, 2016 concurrence on Washington’s exceptional event demonstration: This report identified the following measures in place throughout the Columbia Plateau to manage the land to prevent or control erosion of dust in the case of high wind dust events: USDA-NRCS Conservation measures for Agriculture; Washington’s NEAP; Washington State Fugitive Emissions rules; Wallula Maintenance Plan Control Strategies; and Benton Clean Air Agency Urban Fugitive Dust Policy. These plans and strategies include a variety of controls including but not limited to: planting cover crops, keeping crop residues on surface, requirements to conduct a minimum level of surface tillage, reducing unsheltered distance along the wind erosion direction, producing and maintaining stable clods or aggregates on the land surface, and roughening the land (Section 6.2.1 of Ecology’s report).</p>
<ul style="list-style-type: none"> • The event satisfies the “unlikely to recur at a particular location or a natural event” criteria in 40 CFR 51.1(k); 40 CFR 51.14(c)(iv)(E). 	<p><i>Natural Event</i></p> <p>The high wind dust event that occurred on September 15 and 16, 2013, was an event in which human activity played little or no role, and was thus a natural event. Wind speed and air quality data discussed above were presented to support this conclusion. The IDEQ included in Appendix B media reports, photographic and radar images, and weather warnings that further support the occurrence of the haboob as a natural event.</p>
<ul style="list-style-type: none"> • The event satisfies the “mitigation” criteria in 40 CFR 51.930 and 40 CFR 51.14(b)(9). 	<p><i>Mitigation</i></p> <p>The IDEQ implements the “Air Pollution Emergency Rule” (IDAPA 58.01.01.550) during air pollution emergency episodes by prohibiting open burning and notifying the public of deteriorating air quality. Under this rule, the IDEQ would provide public education concerning actions that individuals may take to reduce exposure to unhealthy levels of air quality during and following such an exceptional event.</p> <p>For the high wind dust event on September 15-16, 2013, the IDEQ was unable to provide prompt public notification/education as the haboob occurred during the evening in Pinehurst, Idaho, and it occurred without warning. Weather service notifications were cited in Appendix B by IDEQ. Additionally, as the area does not experience high wind dust events regularly (the most recent prior</p>

	<p>high wind dust event was in 2010), there were no measures implemented to mitigate the event.</p> <p>Given the short duration of this type of high wind dust event, its unexpected occurrence, minimal contribution from within Idaho's jurisdiction, and the rare frequency of occurrence, the EPA concludes that adequate mitigation was in place in Pinehurst to prevent unacceptable exposure to the public. Additionally, given this was the first high wind dust event that affected the Pinehurst, Idaho monitor in many years, the EPA concludes that the area is not subject to the mitigation plan requirement at this time.</p>
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Conclusion

The EPA has determined that the PM₁₀ value of 157.1 µg/m³ that occurred on September 15, 2013, was due to a high wind dust exceptional event and has regulatory significance for use in IDEQ's PM₁₀ maintenance planning demonstration for Pinehurst. Based on the documentation submitted by the IDEQ dated September 30, 2016, the EPA concurs on the PM₁₀ data value listed in Table 2, which has been flagged by IDEQ in AQS as due to a high wind dust exceptional event.

Table 2. 24-hr PM₁₀ Value Flagged by IDEQ at the Pinehurst Monitor and Concurred on by the EPA as Meeting the Exceptional Event Criteria

Date	PM ₁₀ Concentration (µg/m ³)
September 15, 2013	157.1

The information and analyses presented in IDEQ's exceptional event demonstration package provided weight of evidence sufficient for the EPA's concurrence on the flagged data from the Pinehurst monitor on the date listed above and as described in this document. Accordingly, we are placing a concurrence indicator in the EPA's AQS database for this date at this monitor.

Note that the EPA's decisions on exceptional event exclusions are not considered final agency action until they are acted upon as part of a final regulatory action subject to public notice and comment. Such actions would include, for example, decisions to exclude the affected data from use in an action to designate or re-designate an area, a determination of attainment, or another regulatory decision identified in 40 CFR 50.14(a)(i).